

Using Transactions And COM+ Services In The .NET Framework

**Jonathan Hawkins
Program Manager
Runtime Kernel
Microsoft Corporation**

Microsoft®
PDC 2000
Professional Developers Conference

Microsoft®
.net

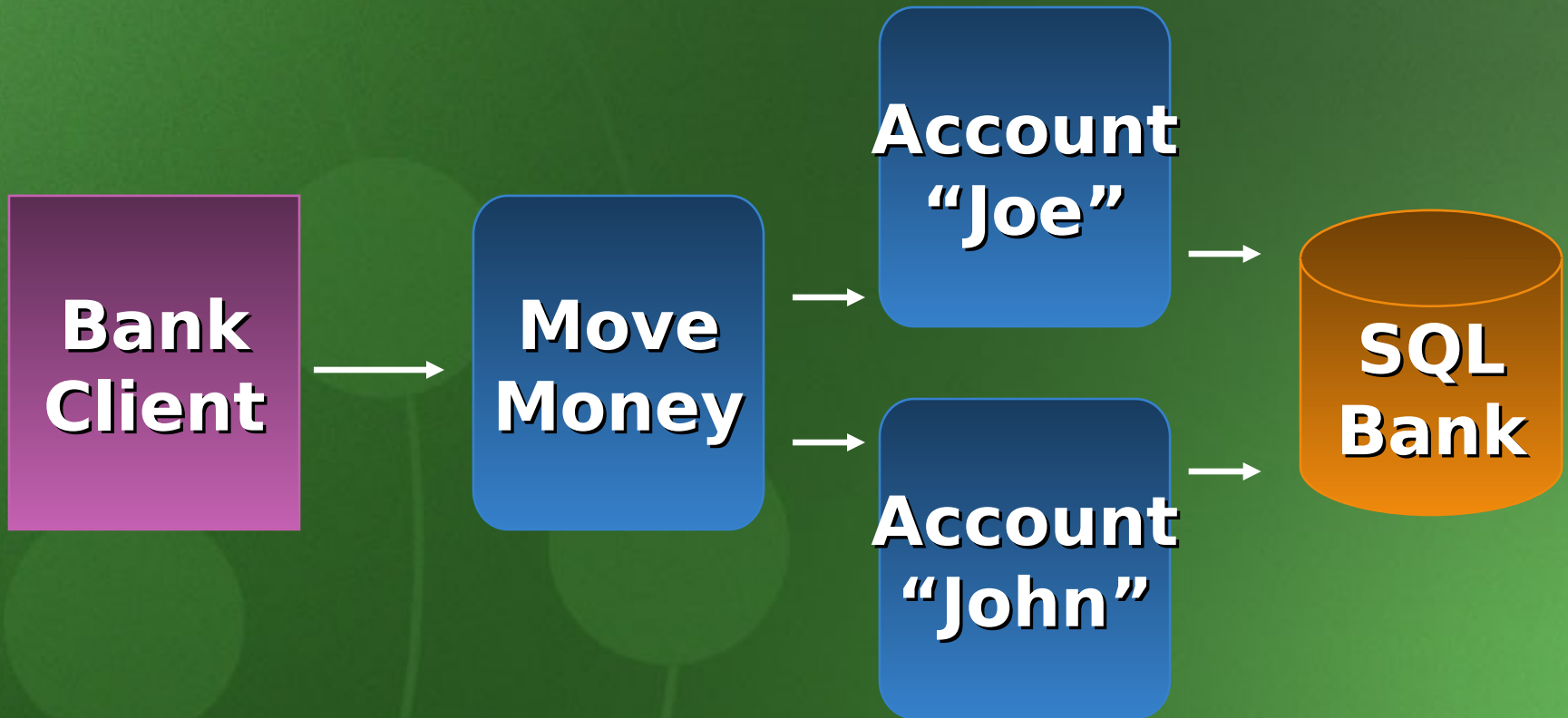
the defining

point

Agenda

- **Bank App Demo**
- **Brief Overview of COM+ Services**
- **Hosting .NET components in COM+ Services**
- **Programming Model for using COM+ Services**
- **Building and Deploying .NET components**
- **Microsoft.ComServices namespace**
- **Diving down into the code**

Bank App Demo



COM+ Services Is...

- **MTS Services**
 - Transactions
 - Security
 - Administration
- **Plus, New 'MTS-like' services**
 - Object Pooling
 - Queued Components
 - Events
 - Others...
 - Auto Completion,
Compensating Resource
Managers

COM+ Services

Transactions

- **MTS Supported...**
 - Transactional attributes
 - Required, Requires New, Supports, Does not support
 - XA-compliant resource managers
 - COMTI - COM Transaction Integrator
- **COM+ Adds...**
 - AutoComplete, AutoAbort
 - Compensating Resource Manager
 - TIP - Transaction Internet Protocol
 - BYOT - Bring Your Own Transactions

Using COM+ Services In .NET components

- **.NET components can be hosted in a COM+ Services app**
- **Can use all COM+ Services**
 - **Transactions**
 - **Just in Time Activation**
 - **Activity Synchronization**
 - **Object Pooling**
 - **Queued Components**
 - **Events**
 - **Etc.**

Using COM+ Services

In .NET components (cont.)

- **.NET components**
 - Activated in a COM+ObjectContext
 - ObjectContext provides Services
- **Integration with existing COM+ Apps**
 - Context flow between COM+ Components and .NET components
 - Regardless of implementation language

Programming Model

- **Service Custom Attributes**
 - E.g., TransactionAttribute
- **Specified at development time on the class**
- **Compiled into the Metadata**
- **Used to configure COM+ Catalog**
- **Attributes enable COM+ Services**
- **Marked components automatically created in COM+ObjectContext**

Account - Attributes

```
using System;
using Microsoft.ComServices;
namespace CSharpBank
{
    [TransactionAttribute(TransactionOption.Required)]
    public class Account
    {
        public void Post(int accountNo, int amount)
        {
            try
            {

            }
            catch()
            {

            }
        }
    }
}
```

Resource Managers

- **Can use regular Resource Manager APIs**
 - ADO through COM Interop
 - MSMQ through COM Interop
 - 3rd Party Resource Managers
- **Can use the new APIs**
 - ADO+ - `System.Data.*`
 - MSMQ Messaging - `System.Messaging.*`
- **Automatically enlist in COM+ Transactions**
- **Update state in the resource**

Account - Resource

```
using System;
using Microsoft.ComServices;
namespace CSharpBank
{
    [TransactionAttribute(TransactionOption.Required)]
    public class Account
    {
        public void Post(int accountNo, int amount)
        {
            try
            {
                //. . . Do some resource operations

            }
            catch()
            {
            }
        }
    }
}
```

Programming Model

- For Services programming model use **Microsoft.ComServices APIs**
 - Happy
 - ContextUtil.SetComplete
 - Not Happy
 - ContextUtil.SetAbort

Account - Prog.

Model

```
using Microsoft.ComServices;
```

```
namespace CSharpBank  
{
```

```
    [TransactionAttribute(TransactionOption.Required)]
```

```
    public class Account  
    {
```

```
        public void Post(int accountNo, int amount)
```

```
        {
```

```
            try
```

```
            {
```

```
                // . . . Do some resource operations
```

```
                ContextUtil.SetComplete();
```

```
            }
```

```
            catch()
```

```
            {
```

```
                ContextUtil.SetAbort();
```

```
            }
```

```
        }
```

```
    }
```

```
}
```


Building

- **Assembly is the unit of deployment for managed code**
- **Provide a Shared Name for the Assembly**
 - **sn -k CSharpBank.snk**
- **Compile code into Assembly**
 - **Provide CSharpBank.snk SharedName as command line option**

Deploying

- **Create COM+ Application**
 - **Use COM+ Component Services Admin Tool or Admin Script**
- **Add Assembly to the Global Assembly Store**
 - **al /i:CSharpBank.dll**
- **Add Assembly to COM+ App**
 - **RegSvcs CSharpBank.dll BankApp**

Services Custom Attributes

Microsoft.ComServices

- Transactions
- Just in Time Activation
- Synchronization
- More to come in the future!

ContextUtil Class

Microsoft.ComServices

- **Contains the common set of operations**
 - **SetComplete, SetAbort**
 - **IsCallerInRole**
 - **IsInTransaction, TransactionId**
 - **ObjectContext**
 - **Etc.**

Interfaces

Microsoft.ComServices

- **COM+ Services Interfaces**
 - **IObjectContext**
 - **ITransaction**
 - **IObjectContext**
 - **Etc.**

Registration With COM+

Microsoft.ComServices

■ RegistrationHelper

- Adds .NET components to COM+ App
- Configures COM+ Catalog based on the Service Attributes on .NET components

Security

Microsoft.ComServices

- .NET components hosted in a COM+ App can use COM+ Role based security
- SecurityCallContext
- SecurityIdentity
- SecurityCallers
- Etc.

Account - ComEmulate

```
using System;  
using Microsoft.ComServices;  
namespace CSharpBank  
{
```

```
    [ComEmulateAttribute("CSharpBank.AccountInternal")]
```

```
    [GuidAttribute("B9E8F6DE-94EE-4aa9-B2E4-3B0B08585500")]
```

```
    [TransactionAttribute(TransactionOption.Required)]
```

```
    public class Account
```

```
    {  
    }
```

```
    internal class AccountInternal  
    {
```

```
        public void Post(int accountNo, int amount)
```

```
        {
```

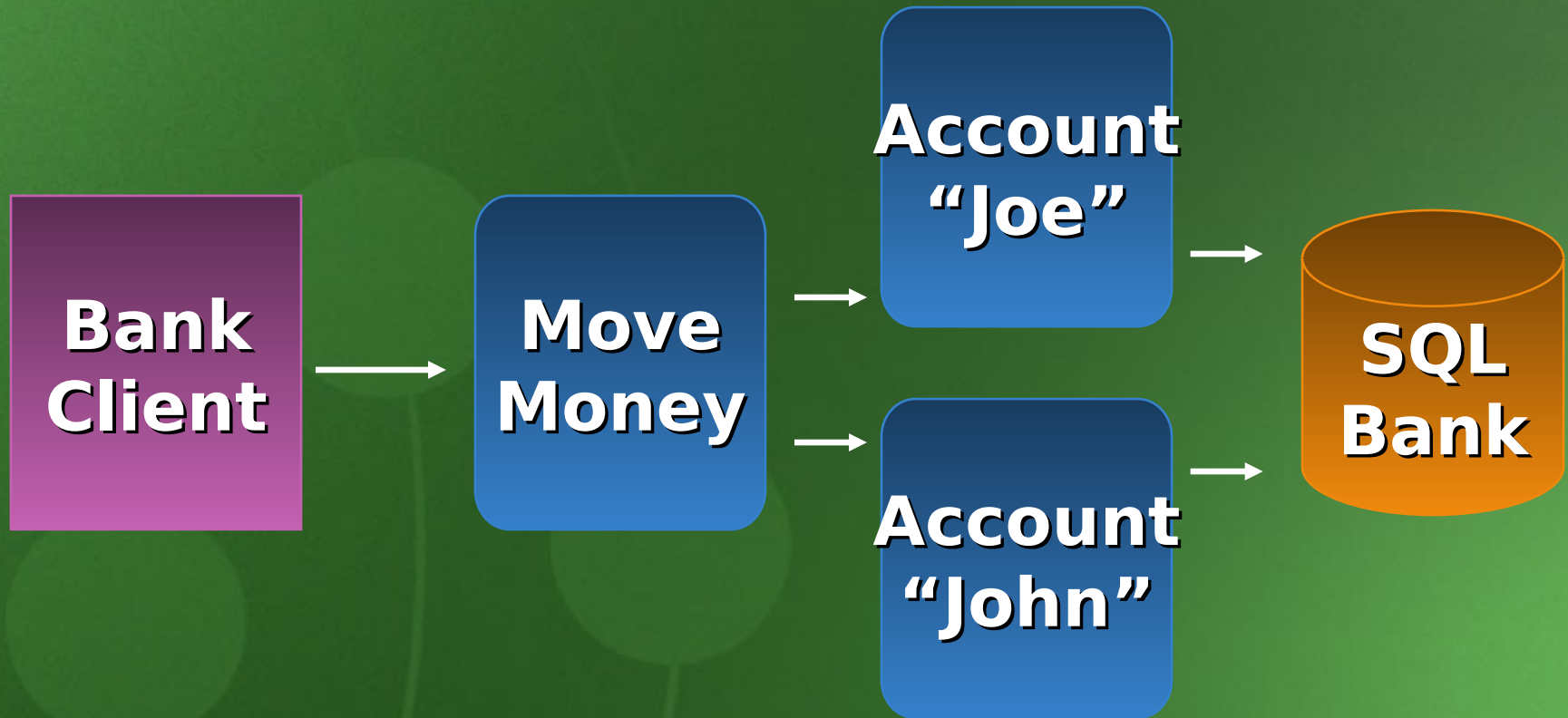
```
            // . . .
```

```
        }
```

```
    }
```

```
}
```

Diving Down Into The Code



ADO+

Using COM+ Services

- **SQL Server Provider**
 - **System.Data.SQL.***
 - **All Managed Code**
 - **Uses SQL Server's TDS protocol natively**
 - **Using COM+ Services Object Pooling for Connection Pooling**
 - **Automatic Transaction enlistment**

ASP+

Using COM+ Services

- **ASP+ Pages and Web Forms can be marked for Transactions**
 - `<@% Transaction="Required" %>`
 - Page / Web Form starts in a COM+ObjectContext with Transaction
 - Just like ASP
- **ASP+ Web Services Methods**
 - Can also be marked for Transactions

Related Sessions And References

- **Other PDC sessions recommended:**
 - **3-312 Partitioning Applications for Hosting**
 - **3-357 .NET Component Services Advances in COM+**
 - **3-211 .NET Framework: A COM Developer's Perspective**
- **Read the “Using COM+ 1.0 Services in a Managed Code Application” Whitepaper in the SDK**

Questions ?



Where do **you** want to go today?

Microsoft